

Stair Climbing Wheelchair for Disabled Person

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Abstract: The goal of this article is to review the state of the art in the technology for Stair-Climbing Power Wheelchair for people with disabilities, without help of any other person. The disabled person climb staircase with the help of wheelchair. a particular focus on the technology that is loosely referred to as assistive devices. In the process, we review research that has been done by different groups on Stair-Climbing Power Wheelchair for manipulation and locomotion.

We will be less interested in examples of devices that simply perform the mechanical function of a person's limb further therapeutic applications are beyond the scope of this article. Main goal is to provide the reader with an understanding of how the technology and science can be used to develop assistive devices for people with manipulative and locomotive disabilities. Also the analytical work carried out so far in this context is reviewed and discussed.

The main conceptual element's that has been proposed to improvise on this idea is mainly to simplify the mechanism and make it work using human effort. The conceptual design, preliminary design, are being done and explained in the report. The usage of electronically operated motions is made in necessary parts (only if necessary). The report also contains about materials to be used and design aspects and constraints that we had to keep in mind while designing. Some of the drawings relating to our project are drawn. The models of wheelchair which helped us in getting an idea of this project are shown in the project.

Keywords: Staircase Climbing Wheelchair, Impaired Mobility, Low Cost Design.

1. INTRODUCTION

Since the beginning of mankind, he has been improving himself in science and technology. This is to overcome his difficulties and reach & improvise his comfort levels.

It's not that every man is born perfect some have their own difficulties, problems and disabilities. Some are since their birth and some by the game of time. They struggle a lot to lead life in the society.

wheelchair is one of the most commonly used assistive devices for enhancing personal mobility, which is a precondition for enjoying human rights and living in dignity and assists people with disabilities to become more productive members of their communities.

The invention of wheelchair is one of the contributions for such physically challenged people. It is a boon for them. Since from the day wheelchair was invented, it has been continuously improving to raise its comfort level and with as many features as possible. We have come across many types of wheelchairs with different shapes, sizes, mechanisms, sources, materials etc. For many people, an appropriate, well-designed and well-fitted wheelchair can be the first step towards inclusion and participation in society.

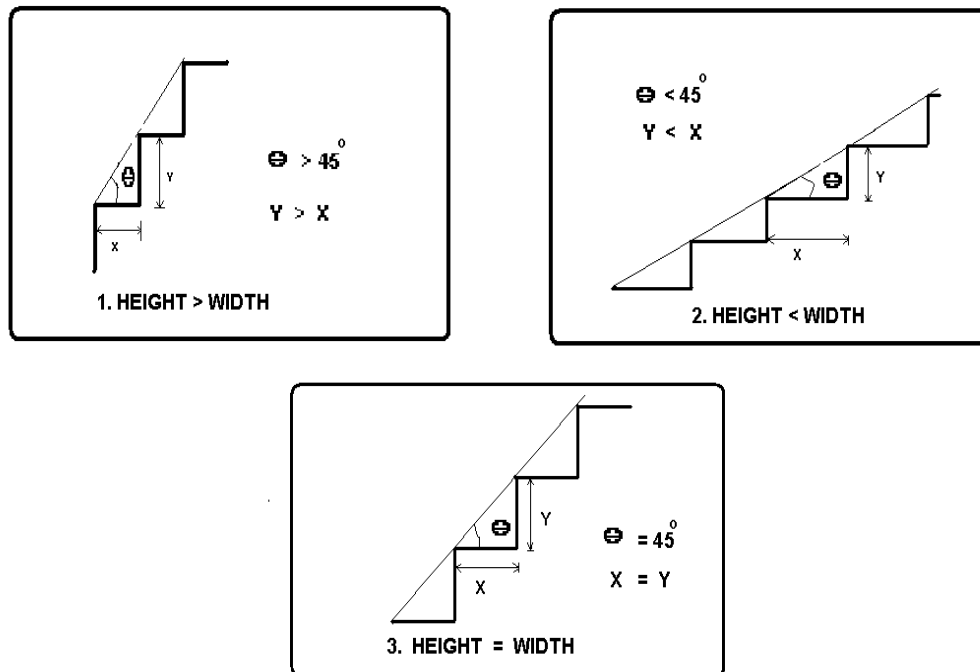
Though the wheelchair is helping the physically challenged & disabled people for their mobility, it is not equivalent to the motion by normal people. They can't run, jump reach all places where ever they wish to go. These suppress the mental level of those people and they start feeling themselves as 'burden' to others. To overcome this psychological depression, the comfort level should be raised up to the 'peak', where they can do all those things that a normal man can do.

So this is our small step or attempt to reach that 'peak'. We wish that this work will become a contribution for the society helping large number of disabled. Keeping all the above things in mind, focusing the possible improvements in wheelchairs we got an idea of a stair climbing wheelchair.

2. WHAT IS NEW IN THE WHEEL CHAIR

The wheel chair is capable of climbing the stairs. However, this concept is already worked out, but it works either with the need of a helper or using electrical power and batteries. Our project aims at climbing stairs mechanically and self-operated, not depending on someone. Simplification is done in both operation and construction. Our project aims at reduction in the overall cost of the stair climbing wheelchair are isolated and do not have access to the same opportunities as others within their own communities. Providing wheelchairs that are fit for the purpose not only enhances mobility but begins a process of opening up a world of education, work and social life.

3. TYPES OF STEPS



There are 3 kinds of steps based on the height and width of step ;

1. The height is greater than width.
2. The height is lesser than width.
3. The height is same as the width.

4. TRANSMISSION SYSTEM

The rotary motion of the motor is transmitted to the operative element to provide an operative working or auxiliary motion. When the required motion is rotary; the transmission takes place through mechanisms that transfer Rotary motion from one shaft to another. Transmission of the motion from the external source to the operative element can take place through Mechanical elements such as belts, Gears, chains etc.

Mechanical Transmission and its elements: -

- 1) Belt Transmission
- 2) Gear Transmission
- 3) Chain Transmission

1) Belt Transmission: -

Belt drive is one of the most common effective devices transmitting motion and power from one shaft to the other by means of thin inextensible belt over running over to pulleys. This largely used for general purpose on mills and factories especially when the distance between the Shafts is not very great.

When the center distance between the two shafts is large than the tight side of the belt should be the lower one the pulley called driver is mounted on the driving shaft while the shaft while the other, which is mounted on the shaft to which power is to be transmitted is called the driven pulley or follower.

When the belt moves over the pulleys there is always the possibility of slipping between the belt and pulley and hence the character of the motion transmitted is not positive when positive action is required. Gears and chain must be used.

2) Gear Transmission: -

Efficiency of power transmission in belt and rope drives is less. The power may be transmitted from one shaft another by means of mating gears with high transmission Efficiency and a gear drive is also provide when the between driver and follower is very small.

3) Chain Transmission: -

Chains are used for high transmission number. They are mostly used when distance between center is short but the center distance is as much as 8m. They are now generally used for transmission of power in cycle, motor vehicle, and agriculture machinery in workshops.

It is general requirement for any machines that they should provision for regulating speed of travel

The regulation may be available in discrete steps or it may be steeples i.e. continuous. The format are known as stepped drives Ex. Lathe machine, milling machine, printing machine etc.

5. CONCLUSION

As paper conclude that Disabled people are increasingly able to lead an independent life and play a more productive role in society with the help of stair climbing wheelchair.

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